

SUBJECT TEACHING GUIDE

G867 - Circuit Theory II

Degree in Electrical Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Electrical Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Further Circuit Theory Further Module in Common with the Industrial Branch				
Course unit title and code	G867 - Circuit Theory II				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA				
Name of lecturer	MARIA ANGELES CAVIA SOTO				
E-mail	maria.cavia@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2032)				
Other lecturers	ALFREDO ORTIZ FERNANDEZ ALBERTO ARROYO GUTIERREZ				

3.1 LEARNING OUTCOMES

- Resolve transient circuits of first order representing the voltages and currents.
- Identify and analyze the work regimes of circuits of second order in the time domain.
- Applying the Laplace transform to analyze transient circuits
- Understand the concept of quadrupole and its applications to the study of electrical and electronic systems. Knowing the forms of association calculating the parameters of the resulting quadrupole. Determine the parameters image.
- Apply Fourier series analysis of circuits with non-sinusoidal periodic excitations.
- LTspice. know how to use the tool for circuit simulation and resolution in any scheme of work.

4. OBJECTIVES

Resolution of electrical circuits, in any regime of work, using the most appropriate method
Providing students with a set of analytical techniques that allow easy understanding, resolution and use of electrical systems.
Providing a set of concepts, methods and tools flexible enough to use them in other subjects of the specialty.

6. COURSE ORGANIZATION

CONTENTS	
1	TRANSIENT CIRCUITS I: Introduction. Transients in circuits of first order with one energy storage element and continuous excitement. Transients in circuits of first order with one energy storage element and alternating sinusoidal excitation. Transients in circuits of first order with several energy storage elements
2	TRANSIENT CIRCUITS II: Transient regimes in second order circuits without excitement nor external sources . Transient response in circuits with multiple meshes . Application of the Laplace Transform for analysis of transient circuit .
3	QUADRUPOLE: Introduction. Quadrupole concept. Parameters of a quadrupole. Association of quadrupoles. Parameters image.
4	CIRCUIT ANALYSIS UNDER NO SINUSOIDAL: Introduction. Values associated with non-sinusoidal periodic functions. Network analysis with nonsinusoidal periodic excitation. Power and theorems.
5	Practices and Practice LTSpice simulation laboratory of the subject.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam: Contents of blocks 1 and 2. Written exam: Contents of blocks 3,4,5 and 6. Attendance to laboratory sessions is mandatory to pass the course	Written exam	No	Yes	50,00
Written exam: Contents of blocks 1 and 2. Written exam: Contents of blocks 3,4 and 5.	Written exam	Yes	Yes	50,00
TOTAL				100,00
Observations				
<p>For the purpose of continuous assessment, if exceeded (greater or equal to 4 out of 10) partial test may be performed on the final exam only the second part not assessed, having obtained her average rating of 5 out of 10 as a minimum to pass the course.</p> <p>If the partial test (less than 4 out of 10) is not exceeded, the final exam will be full.</p> <p>The remote evaluation of the works, practical laboratory exercises and written tests is foreseen, in the case of a new health alert by COVID-19 making it impossible to carry out the evaluation in person.</p>				
Observations for part-time students				
The evaluation will be conducted with the same criteria as full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

SÁNCHEZ, P.; CAVIA, M.A.; ORTIZ, A.; MAÑANA, M.; EGUÍLUZ, L.I.; LAVANDERO, J.C. "Teoría de circuitos: problemas y pruebas objetivas orientadas al aprendizaje". Pearson Educación. 2007.

EGUÍLUZ, L.I.; SÁNCHEZ, P.; CAVIA, M.A.; LAVANDERO, J.C. "Pruebas Objetivas de Circuitos Eléctricos". EUNSA.

PASTOR, A.; ORTEGA, J.; PARRA, V.; PÉREZ, A. "Circuitos Eléctricos". Volumen I. UNED.

PASTOR, A.; ORTEGA, J. "Circuitos Eléctricos". Volumen II. UNED.

BOYLESTAD, R.L. "Análisis Introductorio de Circuitos". Pearson Educación.

IRWIN, D.J. "Análisis Básico de Circuitos en Ingeniería". Prentice Hall.

Materiales teórico-prácticos de la asignatura proporcionados por el profesor.